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ABSTRACT

Ending the use of cash in the United States can provide substantial social and economic gain while requiring only modest levels of investment. One primary benefit is the reduction of cash-related crimes. Because most street crime is committed to obtain cash or uses cash as a transaction medium, elimination of cash will dramatically reduce crime. Technology has advanced in the United States to a point where a cashless society is now feasible, and the benefits of eliminating cash may be more easily obtained. This report illustrates how changing to an electronic cash system, the U.S. Electronic Money System (USEMS), would wholly eliminate certain classes of crimes, severely reduce the incidence of others such as drug crime, and shrink the underground economy. A description of the cashless society explains how USEMS would function, security considerations, rights of privacy, and other basic issues. The report also demonstrates how hundreds of billions of dollars in benefits to both public and private sectors would result from its implementation. (CK)

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Reducing Crime By Eliminating Cash

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Reducing Crime By Eliminating Cash

by David R. Warwick

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David R. Warwick is a real estate investor and businessman. He received his J.D. from Hastings College of Law and practiced law from 1965-1975. He published an earlier article on this subject that appeared in the November-December 1992 edition of *The Futurist*.

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FOREWORD

Despite the considerable efforts of our government during the past decade to vastly increase the resources of the criminal justice system, crime (especially violent crime) continues to increase and plague our daily lives. The vast majority (80 percent) of these crimes involve theft of cash or theft of property to secure cash. And the entire illegal drug trade is negotiated largely in cash. One obvious conclusion to be drawn from these data is that by eliminating cash, millions of crimes committed to acquire cash might also be eliminated.

The proposal to eliminate cash is not a new one. It was first proposed several decades ago, but was quickly dismissed as there was no technology that could be used as a practical substitute for cash. Now with increased reliance on ATMs and the use of debit cards in lieu of checks, one can easily envision a future in which the use of cash as we now know it will be as archaic as the rotary phone.

In this provocative NCCD report, David Warwick tries to take us one step further toward the realization of a "cashless" society. Not only does he describe how such a system might operate, he also begins to identify the potential benefits of such a system in reducing crime and dramatically increasing tax revenues from the now untaxed underground economy. Specifically, he estimates that millions of crimes would be eliminated and the government would generate tens of billions of dollars in new tax revenues.

Like any new technological innovation, there are many obstacles and public concerns that must be addressed. In particular, the role of the government in managing such a system and the associated potential for abusing an individual's personal freedoms and rights to privacy, among other implementation issues, are discussed in detail.

While many may question whether the obstacles to a cashless society can be overcome, David Warwick puts forth a powerful and visionary argument for the enormous societal benefits of a cashless society.

James Austin
Executive Vice President

Crime and Cash

The evening of Sunday, March 7, 1993, marked the end of a busy weekend at a popular Mexican restaurant called The Cantina. Located in the Glenview district in the foothills of Oakland, California, the modern restaurant had become a favorite meeting place for local upper middle-class residents of a quiet neighborhood that was appreciating in value, a community that had become a model for harmonious racial integration.

At about 11 o'clock that evening, a car was parked in the shadows across the street from the restaurant. The three men sitting inside it waited patiently until almost all of the diners had paid their tabs and departed. Then the men burst through the entrance of The Cantina, brandishing pistols, shouting orders to startled patrons and employees to immediately lie face down on the floor, and not to look at the robbers' faces — threatening to kill anyone who hesitated to obey.

The 10 people in the dining area, mostly waiters and busboys, lay face down on the floor while one of the robbers struck several of them with his weapon and stole their wallets. Two of the robbers rushed to the kitchen area, where they found the 38-year-old assistant manager, Scott Paddock, who was working his last shift before beginning a new job in San Diego; the 33-year-old bartender, Albert Hart; and the 24-year-old dishwasher, Luis Vargas. The robbers ordered the three to hand over all the cash in the till, and to open the safe. They complied promptly.

The robbers then shot all three employees. Paddock and Vargas lay mortally wounded on the kitchen floor, while the robbers forced Hart, whom they had shot in the abdomen, along with the 10 other horrified victims, into the restaurant's walk-in freezer.

Everything proceeded perfectly for the robbers. The patrons remained compliant, immobile, and silent as the robbers ransacked the restaurant and stole several thousand dollars in cash from the safe. Uncertain as to whether the robbers had fled, the victims waited in terror inside the freezer for half an hour, until they felt it was safe to come out and call the police.

Scott Paddock died at the hospital at 12:59 AM, leaving his bride of six months with a shattered future. Luis Vargas died an hour later, leaving his wife and two young daughters without a husband and father as well as a means of support. Albert Hart survived his wound, but along with the others in the restaurant that evening, he suffered an indelible psychological trauma that has made full enjoyment of life less attainable.

Despite its familiarity with robbery and murder, the San Francisco Bay Area was shocked by the news of this violent crime. Oakland's Glenview district, an oasis in a city racked by violent crime, was thoroughly traumatized. Flowers of condolence amassed on the sidewalk outside the restaurant. Two days after the murders, a candlelight vigil was held at the restaurant's closed doors and a crowd of over 300 filled the sidewalk and poured into the street.

Those who learned of the tragic event from newspapers, television, or radio were struck with the realization that *yet another* brutal and outrageous crime had occurred in their area. They were even more disturbed by the apprehension that it would happen again, and again. The story was not covered by the California or national news media because almost every urban center has its own similar tragedies to report. For a newspaper to cover all the nation's robberies for just one day (estimated at over 3,100 per day, based on victimization surveys, and 1,880 formally reported to police each day) would require several inches of newspaper print and would be utterly demoralizing to read. Two valuable lives were taken in the robbery of The Cantina, 11 others were put through hell, and a whole community was made to suffer lasting depression and anger — all because criminals sought to steal *cash* they knew was available at the restaurant.

With good reason, many Americans regard crime as the nation's foremost problem. It is estimated that over 34 million crimes are committed each year against individuals, or their homes and motor vehicles. Over 24,000 murders are committed each year, with an estimated six million

burglaries and robberies.[1] Many of our largest cities now include drug-infested urban neighborhoods that have become literal war zones.

Despite soaring arrest, conviction, and incarceration rates in the United States, and the expenditure of $74 billion a year by the criminal justice system,[2] as well as increasingly intrusive police actions that test our civil liberties, the nation's crime rates continue to rival or exceed those of third-world countries. Clearly, new methods must be found to prevent and control crime.

Disabling the Criminal by Eliminating Cash

One possible method for curtailing crime is to eliminate the strong link between cash and crime. The thesis is simple: Most street crime is committed either to obtain cash, or with cash used as a payment medium. Eliminate cash, and you eliminate a great percentage of crime. But since cash performs important and legitimate functions, it cannot be summarily withdrawn from circulation without providing a practical substitute. Other payment media, such as checks, bankcards, money orders, and traveler's checks, are inadequate substitutes to the unique functions of cash. However, a government-operated debit-card system that simulates the functions of cash is an option that merits consideration.

This is not an entirely new idea. Less than two decades ago, Stuart Speiser, a New York aviation attorney, and Leon M. Lederman, a noted physicist and former director of the Fermi Laboratory, separately espoused replacement of cash with commercial debit-card systems.[3] But because their proposals were made when electronic-funds transfer (EFT) was still in its infancy, and before the use of bankcards had penetrated the consciousness of most Americans, their recommendations were not seriously considered.

1. U.S. Department of Justice, Bureau of Justice Statistics, Criminal Victimization 1991 (Washington, D.C. : U.S. Department of Justice, October 1992); and U.S. Department of Justice, Federal Bureau of Investigation, Crime in the United States 1991, (Washington, D.C. : U.S. Department of Justice, September 1992), p. 1.
2. U.S. Department of Justice, Bureau of Statistics, Justice Expenditure and Employment, 1990 (Washington D.C. : U.S. Department of Justice, September 1992), p. 1.
3. Stuart M. Speiser, "Abolish Paper Money and Eliminate Most Crime," American Bar Journal, 1978, Volume 61, p. 47. Leon M. Lederman, "To Reduce Crime, Eliminate Cash," New York Times, op. ed., April 27, 1981.

Today, America is well-positioned to abandon physical cash and convert to electronic money. Widespread usage of bankcards for the purchase of goods and services of almost every type indicates that Americans have become accustomed to electronic-payment media. More to the point, conversion to electronic money is the only proposal *certain* to have a significant effect in reversing the nation's ongoing crime crisis.

This report illustrates how changing to an electronic cash system would wholly eliminate certain classes of crimes, severely reduce the incidence of others — including drug crime — and shrink the underground economy. It describes how the new money system would function, security considerations, rights of privacy, and other basic issues. It also demonstrates how hundreds of billions of dollars in benefits to both public and private sectors would result from its implementation.

Trends in the Use of Cash and Cash-Related Crimes

The term "cashless society" has been in the American vocabulary for over 25 years now. Many Americans assume that in the future, society will conduct all of its affairs without the use of cash. Unfortunately, the arrival of a "cashless society" remains an illusion. Despite increased use of checking accounts and bankcards, with cash in circulation dropping from 13 percent of the GNP at the end of World War II to about 5 percent today, demand for cash remains high.[4] Over 80 percent of all retail transactions in the United States are still conducted in cash,[5] and some 40 million Americans conduct nearly all their transactions in cash.[6] According to one source, only half the adults in the United States have bank accounts.[7] Furthermore, the amount of cash in circulation from 1945 to 1993 actually increased from $26.8 billion to $325.6 billion.[8] During that same period there was a volcanic rise in illegal drug trafficking — conducted almost

4. U.S. Department of Commerce, Bureau of the Census, Historical Statistics, Part I, pp. 224, 993. Also, "Federal Reserve Bulletin," February 1992, pp. A5, A51.
5. Proceedings of a symposium on the U.S. Payment System sponsored by the Federal Reserve Bank of Richmond, "The U.S. Payment System: Efficiency, Risk and the Role of the Federal Reserve," Appendix, Table 2-A1, 1988. This report put the figure at 87 percent for the year 1987.
6. August Bequai, The Cashless Society: EFTS at the Crossroads (John Wiley & Sons, 1981), p. 6.
7. Peter Harrop, "The Future of Payment Media," Financial Times Business Information (London, 1989), p. 63.
8. Historical Statistics, op. cit. and "Federal Reserve Bulletin," op. cit.

exclusively in cash. And, according to many economists, the underground economy, conducted largely in cash, has grown dramatically.[9]

Although the amount of cash in circulation has increased, its gradual relative displacement by checks and bankcards may already be impacting crime rates. Victimization rates for most non-commercial, cash-related crimes have fallen steadily since 1973, the year of the inception of the National Crime Victimization Survey (NCVS). However, robbery fell only 6.7 to 5.6 incidents per 1,000 persons age 12 or older, and personal theft, which fell more than any other crime, still stands at the intolerable rate of 61 thefts per 1,000 persons.[10] Moreover, reported robberies of businesses increased dramatically from 1990 to 1991, with commercial-house robberies rising 11.6 percent, and bank robberies increasing 17.2 percent.[11]

Moreover, these crime-rate statistics obscure the fact that crime is increasingly concentrated in inner-cities where it is a disproportionate problem for African-Americans and other minorities,[12] and where increasingly aggressive law enforcement methods may exacerbate racial tensions. Such statistics also fail to reveal upward trends in crack babies, AIDS, sales of lethal firearms, and the other disruptive social problems linked to the cash-dominated illegal drug trade.

In order to dramatically reduce crime and underground economic activity to tolerable levels, the nation must become *completely* cashless. A mere reduction in the nation's cash supply, no matter how substantial, is insufficient because even a relatively small amount of cash in circulation will sustain widespread crime. Robbers of convenience stores, gas stations, and ATM patrons typically get away with only $300 - $500 in cash.[13] Street muggers take even less.[14]

While criminals, drug addicts, employers of illegal immigrants, and tax cheaters depend upon cash, there are also millions of law-abiding Americans who lack the creditworthiness to obtain bankcards and/or to

9. Edgar L. Feige, The Underground Economies (Cambridge University Press, 1989), p. 5.
10. See Table 3 (from Criminal Victimization 1991, Bureau of Justice Statistics Bulletin, p. 4).
11. U.S. Department of Justice, Federal Bureau of Investigation, "Crime in the United States - 1991," Uniform Crime Reports (Washington D.C.: U.S. Department of Justice, 1992), Table 23.
12. Criminal Victimization 1991, op. cit., p. 2. For example, in 1991 there were 13.5 robberies for every 1,000 black persons, as opposed to 4.4 for whites, and 7.4 for other racial categories.
13. Crime in the United States, 1991, op. cit., Table 23. Average values for gas stations and convenience stores in 1991 were $474 and $387, respectively.
14. U.S. Department of Justice, Bureau of Justice Statistics, Personal and Household Crimes, 1990 (Washington D.C.: U.S. Department of Justice), Table 91, p. 94. 31.1 percent of all robberies involve less than $50 in victims' costs (which includes medical and other incidental loss).

have their checks honored and who, therefore, must conduct transactions in cash.[15] Moreover, there are those who, because of familiarity with cash use, lack of sophistication, or distrust of financial institutions *elect* to deal exclusively in currency and coin.

A true cashless society will not evolve by increased bankcard usage alone. Bankers would have to persuade criminals and tax evaders to voluntarily give up the use of cash. Most cash payments are small, with 75 percent for $2 or less.[16] Many are occasional and do not occur at commercial settings, making it difficult, if not impossible, for the bankcard industry to profit from such small-ticket transactions. Moreover, the United States would not delegate control of the nation's cash system to companies like Visa and MasterCard, privately-owned corporations that do not even reveal their financial statements to the public.[17]

Yet, the bankcard industry has led us to the path and shown us the way. Almost every cash transaction can now be accomplished electronically using current technology. Bankcard companies have recently moved into the fast-food market where sales average less than $7. But while they pick off limited types of cash payments in which bankers can make a profit, they leave unprofitable and/or undesirable cash areas untouched —including drug trafficking and the huge underground economy.

15. The Nilson Report, No. 543, March 1993, p. 7.
16. Bank for International Settlements, Bank Administration Institute, "Payment Systems in Eleven Developed Countries" (1989).
The 0.4 percent figure includes legal-sector cash transactions only.
17. See VISA International, "Thinking Globally, Acting Locally," (VISA International, 1989), p. 3; and VISA U.S.A., "The Evolution of a Full-Service Consumer-Payment System," (VISA U.S.A., March 1990), pp. 1, 10. Even though Visa International, the world's largest and most sophisticated financial processing network, states that "it *is* and wants to be the world's common currency," it has no intention of replacing the United States monetary system and admits that its future plans "may not mean that Americans will live in a completely cashless society...."

The Relationship between Cash and Crime

Cash differs distinctly from other payment media. It bears no imprint of ownership. Payment by cash creates no record and leaves no trail. It is perfect for transacting affairs in secret. One can deny having taken or received it, to subvert criminal prosecution and to hide income from taxation. Then one can pass it on for value, no questions asked.

The lack of any type of recording and the unrestricted negotiability of cash makes it the most detection-free medium of exchange criminals can use. It makes cash their most desired commodity, their prime target, and the epicenter of most crime. One needs only to read the familiar sign fixed to many delivery trucks, "Driver carries no cash," to realize the worst feature of cash: Simply possessing it puts one at risk of being robbed, of being assaulted, or worse.

The most frequent crimes committed in America consist of thefts of cash itself or of property to sell for cash. Table 1 summarizes all crimes either reported to police (Uniform Crime Reports) or reported to the U.S. Census Bureau via its national household survey, the NCVS. Although the NCVS is considered the most comprehensive accounting of crime in America, both of the above reporting systems agree that robbery, burglary, and larceny-theft comprise about 80 percent of all crimes. Furthermore, an estimated 16 percent of all property stolen in the United States is currency.[18]

Theft of cash often involves more than mere loss of property. Every minute, coast to coast, Americans are assaulted and/or murdered for the cash they possess, no matter how small the sum. About 10 percent of all

18. Marilyn E. Walsh, Strategies for Combatting the Criminal Receiver (Fence) of Stolen Goods (Washington, D.C.: U.S. Government Printing Office, 1976), p. 123. This coincides with a computer analysis of data collected in the U.S. Department of Justice, Bureau of Justice Statistics, National Crime Victimization Survey 1991, (unpublished), which revealed that in nearly 18 percent of all crimes in which something was stolen, the item taken was cash, pocketbooks, or billfolds. Only cash was taken in 7.5 percent of crimes; purses were taken in 3.5 percent; and wallets were taken in 5.7 percent.

TABLE 1
CRIME IN AMERICA
1991

	N	%
I. CRIMES REPORTED TO POLICE		
TOTAL CRIMES	14,872,880	100.0%
VIOLENT CRIMES	1,911,760	12.9%
Murder / Manslaughter	24,700	0.2%
Rape	106,590	0.7%
Robbery	687,730	4.6%
Aggravated Assault	1,092,740	7.4%
PROPERTY CRIMES	12,961,120	87.1%
Burglary	3,157,150	21.2%
Larceny-Theft	8,142,230	54.7%
Auto Theft	1,661,740	11.2%
II. CRIMES REPORTED BY VICTIM		
TOTAL CRIMES	34,730,000	100.0%
VIOLENT CRIMES	6,423,000	18.5%
Rape	173,000	0.5%
Robbery	1,145,000	3.3%
Aggravated Assault	1,609,000	4.6%
Simple Assault	3,496,000	10.1%
PROPERTY CRIMES	28,307,000	81.5%
Burglary	5,138,000	14.8%
Larceny-Theft	21,057,000	60.6%
Auto Theft	2,112,000	6.1%

Sources: U.S. Department of Justice, Bureau of Justice Statistics, Criminal Victimization 1991 (Washington, D.C.: U.S. Department of Justice, October 1992).

U.S. Department of Justice, Federal Bureau of Investigation, Crime in the United States 1991 (Washington, D.C.: U.S. Department of Justice, August 30, 1992).

robberies and thefts in the U.S. are for less than $10,[19] and it is not uncommon for victims to be beaten, and sometimes murdered, for only a few dollars.[20]

The innovation of the ATM system marked the creation of America's newest and perhaps most under-reported crime: ATM cash robbery. Although bankcard fraud is sometimes perpetrated through ATM systems, it is almost insignificant compared with ATM robberies. Sidewalk ATM patrons cannot help but expose cash as they withdraw it from the machines. The American Bankers Association, usually loath to frighten bank customers, reported more than 4,400 ATM thefts or assaults in 1990.[21] That reflects a 16 percent increase over their 1987 figure. Statistics being compiled by the California State Legislature indicate that the numbers of ATM robberies across the nation may be much higher, perhaps in the tens of thousands each year.[22]

There is the *indirect* relationship of cash to crime to consider as well. Murder-for-hire, arson, kidnapping, and bribery are all commonly committed for payment in cash. Billions of dollars' worth of stolen goods are fenced for cash each year. We also know from television's images of bundles of confiscated U.S. currency and teenage drug dealers on street corners, that the estimated $300 billion-a-year narcotics trade in the United States is conducted in cash.[23]

19. "Personal and Household Crimes, 1990," op. cit., Table 89.
20. U.S. Department of Justice, Bureau of Justice Statistics, "Robbery Victims," Bureau of Justice Statistics Special Report (Washington D.C.: U.S. Department of Justice), p. 1. A government study based on robbery victimizations from 1973 through 1984 indicates that over half of all robbery victims are attacked, and that about 1 in 12 victims experience serious injuries such as rape, knife or gunshot wounds, broken bones, or being knocked unconscious.
21. "Combatting ATM Crime," Oakland Tribune, July 15, 1991, p. C1-4.
22. California State Senator Chas. M. Calderon, Chairman of the Banking and Commerce Committee and author of the "California Automated Teller Safety Act," monitors data on ATM crime.
23. U.S. Department of Justice, National Institute of Justice, State and Local Money Laundering Control Strategies, (Washington, D.C.: U.S. Department of Justice, October 1992), p. 1.

How the U.S. Electronic Money System (USEMS)[24] Would Work

Just how could one go about eliminating cash? One method would be to establish a federally-operated "debit-card" system, such as USEMS. USEMS is the acronym for a model electronic money system that could be used to replace cash in the United States. In this section, a detailed description of how such a system might be organized is presented. Some of the common arguments against such a system are also reviewed.

First, it must be emphasized that only *cash* would be replaced by the new money system. Checks, drafts, money orders, traveler's checks as well as letters of credit, acceptances, and other financial instruments, would remain in regular usage. Credit-card systems would not change, nor would it be illegal to use promissory notes, IOUs, scrip, tokens, tickets, or chips.

USEMS would require a widely-deployed system of terminals and individual accounts in a government "bank," with electronically-encoded cards. It would differ from existing financial-transaction card systems in the following ways:

1. USEMS would be federally-operated.
2. Payment offered by means of the system would constitute legal tender.
3. System account holders would be able to *receive* as well as pay out funds using their accounts.
4. Funds held in USEMS accounts would be transferable between individual account holders (as well as between merchants and individual account holders).
5. USEMS accounts would not be tied to checking accounts. (Although one would be able to transfer dollars to and from a private-sector bank checking account.)

24. The title is used only as an example in this book and is unrelated to any actual commercial use of the name.

Accounts would be maintained at a USEMS processing center operated by the Federal Reserve System. As distinguished from bankcard systems, in which funds flow between separate financial institutions (e.g., between a customer's bank and a merchant's bank), transactions in the new money system would occur between account holders in the same system.

Communication would be initiated through a variety of terminals linked to the system. Commercial, point-of-sale (POS) USEMS terminals would be located in all retail establishments. Even small merchants such as newspaper vendors would have USEMS terminals. Employers might maintain terminals in their offices to pay invoices and payroll. Government-owned terminals would be installed at convenient locations for the public to use for private transactions — somewhat like public telephones. They might even be posted alongside or as a component of public telephones. Individuals would own and use personal terminals for noncommercial transactions — just as they now own their own telephones. The cost of personal terminals, when manufactured in the tens of millions, should be comparable to the cost of pocket calculators.

Deposits *into* one's USEMS account would be made electronically from other USEMS accounts. One would also be able to deposit checks, money orders, or traveler's checks into his or her USEMS account by negotiating them at banks, which would in turn transfer their USEMS funds into the customer's USEMS account. There would be no counterpart for today's withdrawal of cash. Cash would no longer have physical form. It would exist only as electronic credits in USEMS accounts. The only way one would be able to move money from his or her USEMS account would be by transferring it, via a terminal, to someone else's money-system account.[25]

25. Because the new money system would not function in foreign countries, at least not at the outset, American travelers would use their bankcards or would purchase foreign currency, traveler's checks, or other documented money before departing from the United States. Foreign visitors to the United States would be permitted to open USEMS accounts. Further, if foreign governments adopt USEMS-type systems compatible with the U.S. system, it is likely their "electronic cash" would be honored in this country and vice versa. The exchange rate between the various "currencies" would be automatically computed. Thus, travelers would not have to exchange currencies, pay exchange fees, or risk carrying cash in unfamiliar surroundings. Forerunners of this arrangement, international credit card and ATM systems, are already in operation.

THE TERMINAL REQUIREMENT

Cash clearly has its merits. One can simply look at it, count it, and know how much one has. It can be given or exchanged for another commodity immediately and directly, without the use of a terminal or an intermediary bank, and without documentation, identification, or delay. Consequently, the necessity of using a terminal for every cash transaction seems a nuisance and impractical. It means that small purchases, such as of newspapers and chewing gum, would become more complicated. A terminal of some type would have to be used to give lunch money to a child, to pay a parking meter, a bridge toll, or a tip.

However, the necessity of using a terminal is offset by positive factors. A child would not lose the lunch money or have it stolen.[26] Parking tickets for meter expiration would no longer be given as one's USEMS account would simply be charged for the time used.[27] Cigarette vending machines could be programmed to refuse sales to underage purchasers. Ticket-vending machines could be programmed to give discounts to senior citizens. USEMS would eliminate the nuisance of counting out currency and coins. As these and many other benefits of an electronic money system were realized, objections would wane. Eventually, a USEMS terminal would come to be viewed by most Americans as equal to the convenience of using the telephone.

Since the overwhelming majority of present-day, cash transactions occur between consumers and merchants, over 85 percent of USEMS transactions would be negotiated at retail POS settings — where bankcards are already in common use. It is only in the private, noncommercial setting that we encounter a wholly novel transaction scenario. Individuals would keep personal USEMS terminals in their homes and cars and would carry portable terminals in their pockets or purses.

26. Prepaid cards used in closed environments such as schools, prisons, and company work places are gaining popularity worldwide.
27. "The leading banks of Denmark have teamed up to test and roll out nationally a prepaid debit-card program intended to replace as many coin transactions as possible from laundries to parking meters to public telephones." POS News, January 1993, p. 1. "Prepayment cards, in fact, are an important feature of a newly-developed parking meter system that is under consideration in several [U.S.] jurisdictions." Payments Monthly, June 1992, p. 2.

This should not be regarded as some futuristic concept. Already half a dozen manufacturers produce mobile bankcard telephones (cellular telephones with terminals) that are deployed in taxis, limos, rental cars, and boats.[28] A California company is testing terminals that will be kept and used by consumers in their homes.[29] Moreover, we are on the edge of a radio-telephone-communication revolution, with ever smaller and less-expensive models being placed on the market each year. One source even reports the development of a wrist-watch terminal that uses radio communication.[30] Pacific Telesis Group was recently granted a federal license to test new wireless-telephone technology that promises to spawn the widespread use of low-cost, handheld telephones,[31] and to largely replace today's telephone-line system. These wireless telephones are devices similar in nature to the type of portable terminals needed to transmit USEMS data.[32]

The Nature of USEMS Transactions

Private transactions would require both parties to enter their identification. Thus, each party would swipe his or her card through the terminal and enter the PIN — or press his or her fingerprint on the terminal sensor, or provide whatever particular personal identification verification (PIV) was required by the system. This begins to sound quite complicated, especially when it replaces a system that simply required passing money from one person to another. Yet, it requires as much explanation to instruct a novice how to use the telephone system.

28. "Schaumburg, Ill.-based Omron Systems of America is supplying terminals to U.S. Wireless Data... The hand-held device, named POS-50, is being marketed to such retailers as pizza delivery, appliance repair, towing, limousines, and taxicabs. The terminal uses cellular telephone technology and has a PIN pad interface built-in for debit-card use." POS News, February 1993, p. 8.
29. "'Homepost' will be available to homeowners and renters and will enable the consumers from their home, to pay utility bills, mortgage and auto payments, medical bills, insurance payments, etc. ... merely by sliding an ATM card through the 'Homepost' terminal." Promotional brochure, Home Point of Sale.
30. The Future of Payment Media, op. cit., p. 145.
31. San Francisco Chronicle, March 2, 1991, p. B1.
32. The following typifies the dynamics of telecommunication development:
Associated Press. Chicago. Motorola, Inc. on Tuesday [Feb. 16, 1993] announced a credit card-sized wireless receiver that can store information and transfer it to the new generation of palm-sized computers and personal communicators... Such products are aimed at portable computer users, a market expected to grow in coming years as manufacturers bring out various tiny computers with built-in wireless telephone and facsimile functions.

A typical private transaction using USEMS might go like this:

> Joe drives Paula home after a date. On the way home, he says to his date,
>
> "I hate to ask you this, but could you loan me a few dollars? I'm just about out of gas."
>
> "Don't you have a credit card?" she asks.
>
> "Nah, my folks took it away after I charged my new stereo."
>
> "Sure. We can use my term."

Paula withdraws a compact-sized terminal from her purse. She keys in "$5.00," swipes her card through the terminal and enters her PIN. The terminal read-out panel flashes "Enter Payee." Then Joe swipes his card, enters his PIN, and presses the "transact" button. The data is transmitted to a processing center in a few microseconds. In an instant, "Transaction Complete" appears on the display panel. Joe now has money for gas in his account and owes Paula $5.

How Secure Is Electronic Money from Theft?

One of the first questions people ask about the idea of switching from cash to an electronic money system is, "How *safe* would it be?" Bankcard losses due to fraud indicate that about $300 million, or about 0.1 percent of gross sales, is lost through fraud each year.[33] By comparison, more than four times that amount of cash, over $1.2 billion, is reported stolen every year to police — and no one knows how much goes unreported.[34]

33. The Nilson Report, May 1991, p. 7.
34. An (unpublished) special analysis of the Crime Victimization Survey for 1991 indicates that in 8 percent of all crimes in which something is stolen, it consists of cash only. Projecting this percentage against the total value of property stolen, $14,972,819,000, as reported in the FBI's Uniform Crime Reports, 1991 (Table 24, p. 201), produces the rounded figure $1.2 billion. Since this figure does not include cash stolen along with other property, the actual amount of cash stolen every year must, actually, be far in excess of $1.2 billion.

However, a comparison of the safety of USEMS to current credit-card systems is not quite fair. USEMS would be a *debit* system in which exposure to fraud is distinctly lower. Using USEMS, an account holder would, or would not have, sufficient money in his or her account to cover a payment. Even if one were able to illegally access a debit-system account, the most that could be stolen would be the balance in that account — as contrasted with a credit card's unused line of credit.[35]

Moreover, criminals attempting to steal money from someone's USEMS account would encounter the significant problem of transferring such funds. If electronic money could be stolen, it must be put somewhere. All transfers of money remain within the USEMS system, transferring only from one account into another. Clearly, it would be a simple matter to identify a thief who "stole" money by transferring it into his or her own account.

But instead of stealing cash, couldn't one simply steal a USEMS account holder's card? In robberies of stores and restaurants — the types of crimes often involving violence and loss of life — there is no card to steal since only customers carry and use cards. Robberies of USEMS dollars from retailers or banks could only be made by coercing employees to transfer funds via commercial terminals. Such attempts would be impeded by computer programmed security barriers such as time-locks, limiting disbursement to certain hours and days, required multiple signatures, (i.e., computer-identifiable authorizations), and limitation of payments to pre-designated payees — such as only to named suppliers.

Robbers would still be able to steal USEMS cards from individual account holders. But with the use of personal-identification devices, these cards would be virtually useless to the thief. Some high-tech thieves would, from time to time, find ways to slip undetected through such security barriers. But, their numbers would be small and their crimes would be perpetrated surreptitiously, rather than violently. The bulk of today's robbers — uneducated and with unsophisticated criminal skills such as employing intimidation and force — would simply be left out in the cold.

35. "Industry sources say no noteworthy cases of PIN and magnetic-stripe fraud involving POS debit have been reported." POS News, November 1992, p. 7. Commercial debit-card system losses due to fraud (not including ATM robberies of cash) are, in fact, very low.

USEMS would never reach a level of absolute impenetrable security. However, USEMS security should not be measured against absolute infallibility; it should be compared to the degree of security afforded by the existing cash system.

Would funds kept in USEMS be more or less secure than physical possession of currency and coin — in one's wallet or purse, or in the cash register or safe? The answer is clear. The lack of security in holding cash — worse yet, the danger inherent in possessing it — constitutes the very impetus for abolishing it!

Would Barter and Cash Alternatives Develop?

Anyone contemplating the idea of converting cash to a debit-card system ultimately questions whether people would simply barter, or perhaps switch to the use of cash alternatives, such as foreign currencies, gold, cigarettes, or drugs. Because barter is patently time-consuming, is limited to matches of traders who desire one another's goods or services, and involves items of differing and/or uncertain values, it is highly unlikely that barter would replace any significant number of former cash transactions. Rather, barter would more likely remain at its present activity level.

Widespread use of cash alternatives only emerges when official currencies become unavailable or worthless — as occurred in 18th and 19th century America and in Germany following World War I. Alternatives are created only out of necessity by individuals needing a payment medium. If a national debit-card system were put in operation, cash alternatives would not surface for the reason that a very adequate payment medium would be available, i.e., electronic cash. The disuse of cash alternatives would be ensured by merchants' refusal to accept such unconventional payment. Clearly, if merchants refuse cash alternatives, such payment devices would have little value to the public in general.

Criminals would not resort to cash alternatives because the focal point of almost all payment activity is the legitimate marketplace. Criminals, for the most part, seek money to buy cars, food, housing, clothes, and

other goods and services available from honest providers, just as law-abiding citizens do. Criminals would have no more success in offering to barter or exchange cash alternatives with legitimate businesses than would honest citizens.

The Information Advantage of a Cashless Society

The purpose of converting from cash to electronic money is twofold: First and foremost, it is to prevent or impede criminal activities that depend upon cash. The elimination of cash, in and of itself, would tend to accomplish most of this first goal. It would render a number of classifications of crimes extinct, decimate narcotics crimes, and devastate the underground economy. However, the overall plan would do more than merely create a substitute for currency and coin.

Making cash electronic would also make available a new level of legally-accessible and valuable information, data that would unveil obscure cash dealings. Information would come from two sources within the system: (1) from account holders' file information, and (2) from operational data.

File Information

Were USEMS to be put into effect, nearly everyone in the United States would, as a practical necessity, be compelled to fill out a USEMS application, open an account, and make regular use of it. To prevent criminals from using alias accounts, and to insure accurate identification of account holders,[36] the USEMS account application would require more information than a credit-card application. It would require applicants to supply their birth date, sex, physical description, and Social Security number. Passport number, driver's license number, and additional standard identification data could also be added.

36. For examples, see Jeffrey Rothfeder, Privacy For Sale (Simon & Schuster, 1992). Privacy advocates indicate that a large portion of problems caused Americans by misusage of computer-stored data results from misidentification of accounts holders.

If biometric PIV devices were incorporated in USEMS, they would not only help secure accounts against theft and prevent mistakes in account identities, but make it possible to operate the system without the use of cards. This might consist of imaged photographs, fingerprints, voiceprints, signature-dynamics data, retinal data, palm-geography data, or other biodata required in subsequently developed devices.[37] Data commonly needed in emergencies such as next-of-kin, blood type, and medical warnings, for example, could be stored in file memory as well.

Operational Data

Operational data would consist of information acquired through USEMS-transaction activity. At the very minimum, a single transaction would record the account numbers of the parties, number of dollars transacted, location, time, and date. In fixed-terminal (as opposed to portable-terminal) transactions, the act of transferring funds to or from an account would notify the processing center where the transaction occurred. In cases where individuals were sought — fugitives, missing persons, and runaways, for instance — the subjects' accounts could be placed under automatic monitor. With surveillance of this sort, were a transaction to occur in a targeted account, the requesting agency or individual could be immediately notified. Thus, monitoring one's account (which would require legal process) could lead to the location of either the transferor or transferee. Domestic support payment evaders and other delinquents might be apprehended and held accountable in this manner. And criminal investigations could use transaction data to tie in conspirators and witnesses, and to provide physical evidence.

37. The Los Angeles County Welfare Department, using fingerprint comparisons, recently foiled thousands of cases of fraud in which accounts were maintained under aliases.

The Rights of Privacy Issue

Undoubtedly, one of the primary objections to the USEMS is that it could adversely impact one of America's most cherished and fundamental rights: individual privacy. The proposal to make cash electronic raises two basic privacy issues:

1. Fear of its potential role in the creation of an abusive police state; and,
2. Concern about loose dissemination of personal data to the commercial community (i.e., to creditors, prospective employers, insurance companies, etc.).

The prospect of government recording personal cash-transaction data raises old fears of a Big Brother police state. The primary concern is whether the information system within USEMS could be used as a means to spy on a citizen's every move, a device that demagogic forces in government could seize upon to control individuals. However, there are a number of factors that would serve to diminish this concern. First, the sheer size of the data (based on current numbers of cash transactions of 300 billion per year) would make routine monitoring prohibitively expensive and impractical.

Second, the government does not lack systems to spy or keep check on its citizens. Even the telephone system has been used in such a manner. Government wiretaps could be used to collect information about one's political correctness, one's attitude towards certain officials, one's private associations, one's personal plans and intentions, and one's whereabouts. But government wiretaps are severely limited by law, and their proper use is scrutinized by the courts — just as monitoring USEMS accounts would be.

Of course, USEMS can be distinguished from the telephone system in that USEMS would employ efficient computers to automatically record comprehensive data in a file on every American. But this argument disregards the existence of nearly 2,000 government databanks storing names, addresses, financial and occupational information, and much

more, on tens of millions of Americans.[38] An extensive databank is already being compiled by the U.S. Postal Service, identifying every addressee in the country. The FBI is assembling a DNA-genetic databank. Moreover, many states are electronically fingerprinting all licensed drivers.

As for financial data spying, even today, police officials could simply siphon confidential information from the flow of private checking data, almost all of which passes through government computers as it is cleared and settled in the federally-administered Automated Clearinghouse (ACH). Checking account data represents a far greater dollar value (85 percent of all payments) than cash transactions (which represent only 3 percent),[39] and would reveal matters of far greater significance than cash data (where payments are usually around $4).

It is not for lack of means that the United States has not been made into a police state. To the contrary, it is the success of its institutions, the fiber of those who govern, as well as the participation of those who are governed, that keep personal freedoms alive in the United States.

Rights of privacy under USEMS would simply parallel present-day law — which provides no sanctuary for deals done in cash. Federal and state agencies, such as the IRS, DEA, FBI, local taxing authorities, and welfare and police departments, have always had conditional access to bank records of cash deposits and withdrawals. Government officials can question witnesses about cash transactions and they can mark money for use in sting operations. In civil matters, such as in child-support or bankruptcy proceedings, examination of one's cash transactions is not precluded by any right of privacy.

Could USEMS become yet another easily accessed databank, one much larger and threatening than anything now existing, that might feed information to super credit bureaus or specialized reporting agencies to further undermine privacy?[40] Admittedly, unrestricted exposure of USEMS data could make an account holder's life an open book that could be abused by commercial and government interests. Application information, alone, would provide an eavesdropper with a verified name, address, description, photo, Social Security number, birth date, marital

38. Ibid., p. 126.
39. The Future of Payment Media, op. cit. p. 7.
40. See Jeffrey Rothfeder, Privacy For Sale (Simon & Schuster, 1992), p. 25.

status, and more. Transaction data would provide a full financial profile. The credit side of one's account would reveal sources of income (e.g., wages, worker's compensation or unemployment insurance benefits, dividend income, and accounts receivable). The debit side would show where one shops, which restaurants one frequents, how much one spends at each, how much one spends on jewelry, which friends or relatives one gives money to, whether one buys lotto tickets, spends money at bars, how much one tips waiters, and where one travels. Use of such information, augmented by data from private sector databanks, could result in inequitable denials of employment, insurance coverage, and business opportunities as well as barrages of unwelcome telephone sales pitches and junk mail. But there are existing laws restricting disclosure of confidential data by government.[41]

These privacy laws, by and large, put government-held personal data, such as Social Security and census information, beyond the reach of commercial interests and set them apart from the body of commercially-held data, the latter of which is freely bought and sold in the marketplace.

Despite occasional leakages of government-kept data, the numbers of mishaps are minuscule and in no way equal to the proliferation of personal data from commercial sources.

Privacy legislation and enforcement can and should be improved. Federal agencies are charged with taking the Privacy Act lightly. IRS and law enforcement personnel are accused of rummaging through confidential files to determine the financial capacity of citizens to pay their taxes, or looking for indications that certain persons have committed crimes. Furthermore, few prosecutors, according to those who have researched the subject, have been able to make breach-of-privacy cases stick.[42]

Ideally, enactment of USEMS would be accompanied by specific

41. The Privacy Act, first enacted in 1974, prohibits government from disseminating information without consent of the subject party. The government is required, even when consent is given, to keep records of all disclosures and to whom they are made. (However, law enforcement and other government bodies are specifically exempted from these restrictions.) The Tax Reform Act of 1976 requires the Internal Revenue Service to give due notice of its intention to inspect records. The Right to Financial Privacy Act of 1978 prohibits the federal government from accessing bank account records without the signed consent of the account holder or without a subpoena. The Fair Credit Reporting Act of 1970 allows citizens, among other conferred rights, to challenge the correctness of financial records. The Counterfeit Access Device and Computer Fraud Act, passed by Congress in 1983, makes unauthorized disclosure of information from government computers a crime. And there is an army of money-hungry lawyers standing ready and eager to take on invasion-of-privacy cases.
42. Ibid.

laws and regulations guaranteeing account holders protection against invasions of privacy. Access control systems, limiting computer entry to the fewest personnel possible, and using passwords that change daily, and/or other security barriers should be required on all USEMS computers. Computer personnel should be rotated periodically. Current law already requires maintenance of computer access logs. However, with USEMS, account holders would be notified of the names and dates of accesses to their accounts, the purpose, and where data was sent. Criminal penalties would be established for selling confidential USEMS data or using data for malicious purposes. The proposal to enact USEMS could well serve as an opportunity to press Congress for a data protection board, or other privacy safeguards.

While the fear of unchecked dissemination of personal data by government runs contrary to fact and is unwarranted, it is fairly certain there would always be a tiny trickle of such divulgences from USEMS. However, the tradeoff between the harm caused by this trickle and the overall benefits of USEMS, both in numbers and in substance, is an absolute bargain for the nation.

The indignities, injustices, and damages that would be suffered by an extremely few individuals is practically insignificant when weighed against the millions of crimes that would be prevented, and against the tens of billions of dollars that would be saved by using USEMS. The horror stories of computer-data privacy violations, such as wrongful denial of employment to individuals, arrests of innocent citizens because of identity mixups in computer data, and denials of medical insurance based on erroneous data locked into commercial databanks, are simply not in the same league with the potential of USEMS to save thousands of lives and prevent millions of injuries from violent crime, to resolve much of the illegal drug trafficking crisis, to save individual Americans tens of billions of dollars each year in stolen goods losses and high insurance premiums, and to relieve America's tax burden by raising tens of billions of dollars from the underground economy. Moreover, if the abolishment of cash is as successful in these achievements as it promises to be, the subsequent legislative environment for enacting stronger privacy regulation will have been much improved.

The issue of privacy of cash-transaction data is relevant to the War on Drugs. What has developed from the government's crackdown mentality toward drug offenders is a "drug exception" to the Bill of Rights that threatens everyone. Commando-like raids on homes of innocent citizens, seizures and forfeitures without fault — and irreconcilably-harsh mandatory prison sentences — have become standard in the United States. While this heavy-handed assault has failed to check drug trafficking, it costs the nation huge amounts of money and suppresses rights of privacy and other personal freedoms. As argued later in this report, the inauguration of USEMS could obviate the need for a War on Drugs. If so, USEMS would, circuitously, tend to *restore* personal freedoms, including rights of privacy.

The Impact on Specific Crimes

To analyze the effect of USEMS in reducing crime, it is helpful to divide crimes into three categories: (1) crimes that would no longer exist with the abolition of cash, (2) crimes which by their nature do not involve money, and (3) crimes involving money but which can be perpetrated in media other than cash.

The most dramatic effect of a cashless society is seen in the first category. Bank robbery, ATM robbery, cash-register holdups, and any other crime in which theft of cash is the objective, would become impossible to commit. Convenience store and gas station holdups would cease to occur. Bus and taxi drivers would not be robbed. Pockets would not be picked. Coin-operated machines would not be broken into.

Making cash electronic would eliminate a large proportion of the nation's 1.1 million robberies, 5.1 million burglaries, and 21 million larceny-thefts (1991 statistics — see Table 1).[43] According to a special analysis conducted by the Bureau of Justice Statistics (BJS) of 1991 victimization data, a high percentage of robberies, burglaries, and larceny-thefts are

43. U.S. Department of Justice, Bureau of Justice Statistics, Criminal Victimization in the United States, 1991 (Washington, D.C.: U.S. Department of Justice), Table 2, p. 3.

perpetrated to steal cash or property to sell for cash. The BJS analysis found 1,938,000 thefts (larceny, robbery, or burglary) in which only cash was taken; it identified an additional 902,000 thefts of purses; and 1,468,000 thefts of wallets. These total up to some 4.3 million thefts, or 12 percent of the total 34.7 million crimes reported via the NCVS.

The second category of crimes does not necessarily involve money in any form. Violent crimes, such as murder, rape, and assault and battery, may neither involve nor be motivated by money. Theft of automobiles, securities, and jewelry, for example, do not involve money.

The third category of crimes may be conducted in non-cash media of exchange. Theft by check or electronic transfer, embezzlement (by check or EFT), fraud, insurance fraud and arson fraud are typically perpetrated without the aid of cash. This group of crimes is neither prevented nor *directly* affected by the disuse of currency and coin. Murder-for-hire, bribery, receiving stolen property, prostitution, loan sharking, sale of narcotics, to name a few, can all be committed by the use of *quid pro quo* other than cash, such as checks, money orders, jewelry, traveler's and cashier's checks, and foreign currency. Of course, the USEMS system itself would be available as a payment medium in crime — but that medium would be a last choice.

The abolishment of cash would not eliminate all robberies or burglaries; however, most of the present-day motive for committing such crimes would have disappeared or at least would be severely diminished. Some burglary of homes, offices, and automobiles would continue, as would shoplifting of merchandise. But with cash no longer in existence, a thief would be limited to stealing jewelry, silver, tools, office equipment, car stereos, and the like. Then the thief would have the problem of trying to sell the stolen goods.

Buyers of stolen goods would know they risk being turned in to the authorities by the people they deal with, should such accomplices get arrested. A savvy buyer of stolen goods would not pay with a traceable medium such as a check, for obvious reasons, even if the seller would accept it. Using USEMS dollars would be even worse, as these would document the transaction. The buyer could use a money order or cashier's check, but, if any of these payment instruments were negotiated in a

subsequent illegal drug sale, an investigation of the same could lead police to the stolen-goods buyer, and ultimately reveal his or her crime.

All crimes, however, even those involving no form of money whatsoever, would be impeded by the employment of USEMS file and operational data. In most crimes, two or more persons are involved, and they must be tied together by evidence. They are the victim and the criminal. In some cases they are co-conspirators. USEMS could be used to locate and identify witnesses and suspects, alike, and retroactively place them at specific locations, and to date events tied to crimes. USEMS holds the potential to save millions of hours of police work and give a powerful new investigative dimension to law enforcement.

Taking into consideration that the overwhelming majority of crime in the U.S. involves cash, it is plausible that at least 15 percent and as much as 40 percent of crime (half the percentage that robbery, burglary, and larceny-theft constitute of all crimes) in general would be prevented (either made impossible, or deterred) by implementing USEMS.[44]

The Impact on the War on Drugs

One of the most promising aspects of USEMS is its potential to reduce drug trafficking and related criminal activity. Illegal drug crime dominates the justice system throughout the United States. It is estimated that the 1990 federal, state, and local budget for drug control alone was $28 billion.[45] Moreover, the costs of drug crime are not limited to the public sector. Private sector costs for stolen goods, medical expenses, loss of earnings, lowered property values, increased insurance rates, and other social costs are astronomical.

Drug trafficking is not about drug addiction; it is about money and profits. Realizing this, a growing number of Americans have concluded that the drug plague will end only by taking the profit factor away by

44. Five of the seven categories of crimes used in victimization surveys are crimes that have, as a common motive, the acquisition of cash, either directly or by subsequent sale of stolen property. See the chart of crime in Criminal Victimization 1991, op. cit., p. 3. Moreover, many criminal acts which commence in the pursuit of cash, end up as statistics for violent crimes, such as murder and rape.

45. Peter Reuter, "Hawks Ascendant," The Punitive Trend of American Drug Policy (RAND/RP-153, 1992), p. 21.

legalizing the sale of narcotics. While the logic of this proposal is clear, it is not a clean solution to the problem, and its proponents remain ambiguous as to how to handle such possible side-effects as increased addiction.[46]

Making America's cash electronic might serve as an acceptable alternative to legalization or decriminalization of illegal drugs. While it would not eradicate the drug problem, it could very well reduce the problem to a manageable level. On the other hand, USEMS could operate contemporaneously with legalization to obstruct and discourage abuse of newly granted liberties.

Drug crime is not just about any form of money; it is about *cash*. Virtually every major drug sale around the world is conducted in U.S. currency. Making cash electronic would create fundamental payment problems for dealers and traffickers. Their negotiation of transactions in USEMS dollars would be tantamount to putting evidence of drug operations directly on police computer screens — names, addresses, amounts, dates, computerized photographs, and fingerprints. Moreover, IRS auditors could retrieve entire USEMS-activity histories of those involved in crime. Drug-using fugitives and others sought by law enforcement officials would be reluctant to conduct their illicit affairs in USEMS dollars.

The common drug dealer, as long as he were able to stay in business, would be forced to choose other payment media. Since he would not be foolish enough to accept ordinary checks from buyers, there would only be money orders, cashier's checks, or traveler's checks available as payment media. Perhaps by using phony or blank payees on these instruments, parties to illicit sales would hope to throw law enforcement off their tracks. However, not only do such instruments leave paper trails, but their use would mean that a dealer's customers would have to acquire these money orders or cashier's or traveler's checks. In turn, the customers would need some medium of exchange with which to buy such documented money.

There are drug users with conventional sources of revenue and those who resort to crime for income. The former group is comprised of occasional drug users who use cocaine, marijuana, and "designer" drugs for

46. Mathea Falco, The Making of Drug-Free America (Time Books, 1992), p. 176.

recreational use and who pay for their drugs with legitimately acquired income.[47] These employed or affluent drug users would continue to purchase relatively small amounts of their preferred drugs without much risk of detection. For example, it would not be difficult to hide the occasional purchase of $250 of high-grade marijuana or a $20 "hit" of Ecstasy via money orders or cashier's or traveler's checks. However, the use of such instruments to buy illegal drugs, as compared to the use of cash, would considerably increase their risks of being criminally charged. For middle- and upper-class drug users, the perceived stigma of being arrested and jailed is traumatic and can potentially end a career. Having to use USEMS, or money instruments, which provide evidence of transactions, rather than untraceable cash, is, therefore, bound to deter a significant percentage of this group.[48]

Heavier drug users and addicts who primarily support their habit by theft would be doubly affected by a switch to electronic money. For them, the problem is not just greater exposure to prosecution because of the payment-media trail, but the more serious problem of how to acquire any type of payment. Drug-addicted prostitutes would acquire funds from clients paying by money order, or from those willing to risk exposure by paying in electronic money. Some addicts would be crafty enough to embezzle funds from their employers, partners, spouses, or family businesses — or, all of these. But how would a typical hardcore addict, who steals to purchase drugs, acquire USEMS dollars to purchase drugs directly (if dealers would accept USEMS dollars), or purchase money orders or cashier's checks?

One can imagine a robber in a USEMS society — no longer able to hold up grocery stores, snatch purses, or force victims to withdraw cash from ATMs — coercing a victim to buy a money order or cashier's check. Clearly, an act of that sort would involve witnesses, could get very complicated, and run a high risk of arrest.

Conceivably, a desperate drug user could force a victim under threat of violence to transfer USEMS dollars into his account. But that method of theft would be short-lived because transaction data and account records

47. Peter Reuter et al., "Money from Crime," A Study of the Economics of Drug Dealing in Washington, D.C. (Rand Corporation, June 1990), pp. 15-17.

48. This effect would be even stronger if Congress were to legislate a high sales tax on the purchase of illegal drugs, payable by the purchaser.

would not only identify the criminal, but also would provide evidence of the crime. Furthermore, the thief's subsequent use of his USEMS account (which the thief would have to use to spend the stolen funds) could be monitored to locate him. The dead-end nature of a forced USEMS transaction should render it an infrequent occurrence.[49]

These scenarios presume that the victim would report the crime. And, it raises the troubling concern that threats of and actual violence would increase as some segments of society become more desperate to secure illegal drugs. Undoubtedly, intimidation would increase and succeed in some cases. However, with USEMS data available as evidence with which to locate criminals, victims might not be as reluctant to report crimes in the future. Once the general public understood the workings of USEMS, the realization that the new "cash" was not susceptible to theft, at least not without the high likelihood of being caught and convicted, would occur. Nonetheless, eliminating cash alone would not eradicate the drug problem and its negative consequences on society.

Where would all this leave the addict, the dealer, and higher-level functionaries in the illegal-drug trade? Initially, some small-time dealers would probably risk accepting USEMS dollars from the limited number of customers who could and were willing to tender them. But data from USEMS would lead police directly to these dealers. Not only would sales have dropped because of the deterrent effect on occasional users, but also the arrest rate for dealers would have increased.

Even if some user-level sales were conducted in USEMS money, higher-ups in the trade would not take the chance of accepting payment in that form. The numbers of transactions and of dollars involved at distributor levels, if made via USEMS, would highlight activity and alert law enforcement officials. Dealers accepting USEMS payment would have to purchase money orders or cashier's checks with which to pay their distributors.

Any continued drug trade would see distributors and importers stuck with bundles of documented money — which would be even more

49. A special USEMS procedure could be provided allowing anyone who had been "robbed" (i.e., forced to transfer USEMS funds against their will) to put a stop via any terminal on the USEMS account into which such funds were transferred — the identity of which would be discovered by referencing the last transfer made from the victim's account.

conspicuous than stacks of cash. After USEMS were put into operation, the legitimate use of money orders would probably decline, and, consequently, there would be fewer in circulation. One can imagine a bank teller's thoughts, when approached by someone trying to deposit a stack of money orders, especially if they were made out in amounts of $5, $10, or $20.

To evade detection, drug dealers would probably employ purchasing agents and acquire money instruments issued in blank. But, no matter how devious such schemes might be, they would always involve more parties, more steps, and a greater likelihood of discovery than the use of currency entails.

In summary, electronic money would significantly undermine illegal drug trafficking in a number of ways. Sales would dry up from the bottom. Occasional users, deterred by fear of being found out through payment-transaction records, would fade away. The street addict, the backbone of the trade, deprived of his traditional sources of income, would be unable to raise an acceptable form of payment for drugs and would be left stranded. The numbers of burglaries and thefts across the nation would decline sharply. Fencing operations would shrink. Dealers' revenues would fall dramatically. At the same time, their continuing offenses would result in quicker arrests and convictions. Drug suppliers would find themselves unable to hide their earnings, both from the police and from the Internal Revenue Service. The common urban American scene of heavily armed youth with pockets bulging with cash selling drugs through car windows would become history. USEMS could mark the end of an ugly era of rampant crime.

The Cost Benefits of Eliminating Cash

There are a number of economic consequences associated with the conversion from a cash society to the USEMS. In this section, a discussion is presented on the operational costs of the USEMS system, the various types of additional federal and state tax revenues that would be generated, and government costs associated with the criminal justice system and other federal benefit programs that would be averted. While precise cost/benefit estimates cannot be made at this time, it is possible to begin identifying how such an overall assessment can be made and the dimensions of such an estimate.

The Operational Cost of USEMS

It is far too early to project the government costs for operating USEMS, a system that exists in bare concept only. One can look to bankcard company operations for indications of operating costs. However, this serves only as a rough guide because there are substantial differences between the proposed USEMS transaction and commercial bankcard transactions.

A credit card transaction involves at least five parties: the customer and his or her bank (the card issuer), the merchant and the merchant's bank, and the bankcard processor. Up to nine steps are involved in the transaction, including switching, processing through multiple computers, as well as follow-up paperwork and accounting of the various fees charged and collected amongst the parties.

The USEMS transaction would involve only three parties: the payor, the payee, and USEMS. There would be one computer operation, no switching, and only a fraction of the communication and accounting involved in commercial operations. Moreover, the number of USEMS transactions, if they equal today's cash transactions, would be hundreds of times greater than those of commercial debit cards, and should, therefore, benefit from economies of scale. For these reasons, as well as the absence of a profit factor, the cost per USEMS transaction should be

substantially lower than that for commercial bankcard transactions.

Some experts believe that a $0.05 processing cost for commercial debit-card transactions is achievable.[50] If this is true for the relatively more complicated commercial debit-card transaction, then a USEMS transaction should cost something less than $0.05. Assuming 300 billion transactions per year at an arbitrary cost of $0.03, USEMS operations would cost $9 billion annually.

The cost of operating USEMS would be offset by the government's savings as a result of no longer having to operate the currency and coin system. The direct cost of the cash system includes the Treasury Department's expenses of printing and minting money, transporting and delivering new money, as well as retrieving and destroying worn-out money and maintaining Secret Service operations in detecting counterfeiting and money-laundering schemes.

Coming research on the cost of the two systems will reveal whether USEMS would be more or less expensive to operate than the cash system. If it indicates that USEMS' costs would exceed those of cash, the deficit could be compensated for by imposing a transaction fee (a "discount," to use a commercial term) on merchants.

Merchants, from vending-machine operators to supermarkets, must pay cash-handling costs, pilferage, theft loss, and various types of security expenses associated with cash. It was grocers, as far back as the early 80s, who, realizing the benefits of replacing cash and checks with EFT, pushed so hard to get bankcard service in supermarkets. As long as the government's "discount" fees were set at a level allowing merchants to retain some of their advantage in making cash electronic, they should not object to the fee. Some 87 percent of today's cash transactions are at POS.[51] The same percentage can be projected for the future. Thus, while non-commercial USEMS transactions would not be charged a fee, most USEMS payments would generate government revenues. These revenues, together with the government's cost savings from discontinuing use of currency and coin, should assure that the net effect of the change from cash to electronic money would be minimal if not fiscally positive.

50. The Future of Payment Media, op. cit., p. 122.
51. The Future of Payment Media, op. cit., p. 7.

Increased Tax Revenues

Electronification of America's cash would generate substantial sums of formerly unpaid tax revenues from the underground economy. Referred to here are transactions done in cash to avoid payment of income taxes, sales taxes, and permit and license fees. Estimates of the size of the underground economy range from 2.1 percent (an IRS estimate) to 27 percent of the $6 trillion GDP.[52] For purposes of our calculations, we will assume it to be 10 percent or $600 billion.

Edgar L. Feige, professor of economics at the University of Wisconsin, reports that "the available evidence is insufficient to determine the exact proportion of unreported income that is transacted with currency, but it is reasonable to assume that 25 to 35 percent of such payments are, in fact, made with checks."[53] By this estimate, 65 to 75 percent is in cash. Using the more conservative 65 percent estimate produces a $390 billion estimate of the underground economy being conducted in cash. Calculating how much tax revenue might be raised by making cash electronic involves several steps. First, the *gross* figure, $390 billion, must be discounted to allow for business expense. Assuming a 50 percent overall business expense, the *net* taxable income would be $195 billion.[54]

Second, it is probably true that some underground activity would continue despite the conversion to USEMS. Some undergrounders would remain undeterred, and the IRS could not chase down every tax dollar. Some former cash undergrounders would switch their covert transactions from cash to checks or money orders, and thus remove their activity from the effects of making cash electronic. Arbitrarily assuming that 20 percent of the underground cash would continue even after the new money system were put in operation, reduces the target fund of $195 billion to $156 billion. Multiplying this $156 billion by a very moderate income-tax bracket of 15 percent, about $23.4 billion would be raised in previously unrealized income-tax revenues.

52. The Underground Economies, op. cit., pp. 1-9.
53. The Underground Economies, op. cit., p. 41.
54. The overall 50 percent allowance for business expense may be too generous for the reason that many undergrounders offer services, rather than goods, have no cost of goods to pay, and pay out little in overhead.

State sales-tax revenues would rise as well. Assuming that 20 percent of the underground economy involves sales of taxable goods, and using a mean 4 percent sales tax rate (which takes into consideration that some states do not levy sales taxes), would indicate that another $4.8 billion in sales tax revenues would be generated across the states.[55]

Taking into account these estimates, plus other sources of revenues such as local licenses and permit fees, the net gain in government revenues would easily reach $30 billion per year (see Table 2).

Reduced Government-Program-Benefit Fraud

Removing cash would also help reduce widespread government-program-benefit fraud. Some recipients of various government programs falsely represent themselves as members of low-income groups. Much of this misrepresentation is perpetrated by intentionally not disclosing income received in cash. The recording of electronic "cash" payments, which would be available for quick verification, would put an end to such fraud. This is an area ripe with huge latent government cost savings. A partial list of programs affected is shown in Table 3.

Unfortunately, no hard data on government-program fraud are available.[56] However, Abt Associates reported that the following percentages of total benefits paid under each of the following programs (in 1982) were fraudulent:

AFDC	2.5%
Food Stamp	4.5%
SSI	0.5%
UI	2.5%[57]

55. $600 billion (size of the underground economy) x 20 percent x 4 percent sales tax = $4.8 billion.
56. Abt Associates, Inc., "Unreported Taxable Income From Selected Illegal Activities," Volume II, March 31, 1983, p. 253. In 1984, the IRS contracted with Abt Associates, Inc., to research the extent of government-benefits fraud. The following is an excerpt from their report: "In this section we estimate fraudulent income obtained from six government benefit programs: AFDC, SSI, UI, Medicaid, Medicare and Food Stamps.... Most of the literature on the subject focuses on ways to prevent it, rather that to estimate its extent.... Conversation with personnel at both state and federal levels indicated that enforcement personnel have little idea of the extent of fraud not referred to them for investigation.
57. Ibid., pp. 253-303.

TABLE 2
PROJECTED TAX BENEFITS OF A CASHLESS SOCIETY

A. Total Gross Domestic Product (GDP)	$6 trillion
B. Size of Underground Economy @ 10% of A	$600 billion
C. Underground Economy Conducted in Cash @ 65% of B	$390 billion
D. Discount for Business Expenses @ 50% of C	$195 billion
E. Discount for Undetected Underground Economy @ 80% of D	$156 billion
F. Federal Taxes @ 15% of E	$23.4 billion
G. Additional State Sales Taxes @ 4% x B x 20%	$4.8 billion
H. Additional Revenues from Fees, Permits, etc.	$1.8 billion
I. Total New Revenues	$30.0 billion

TABLE 3
FEDERAL PROGRAMS THAT WOULD BE IMPACTED BY USEMS

PROGRAM	TOTAL STATE & FEDERAL BENEFITS (IN BILLIONS)
Medicaid	$72.2
Maternal & Child Care	0.9
Aid For Dependent Children (AFDC)	21.2
Supplemental Security Income (SSI)	22.2
General Assistance	7.8
Food Benefits (Including Food Stamps)	25.3
Low-Rent Public Housing	3.9
Section 8 Housing	10.6
Earned Income (refunded portion)	17.2
Low-Income Energy Assistance	1.6
Unemployment Insurance (UI)	16.5
Worker's Compensation (Disability Portion)	19.2
Total	$218.6[58]
Assume 5 percent fraud	10.9

58. U.S. Department of Commerce, Bureau of the Census, "Statistical Abstract of the United States," The National Data Book, (Washington, D.C.: U.S. Department of Commerce, 1991), Table 565 (p. 357), Table 567 (p. 358), Table 584 (p. 366).

Because of the difficulty in detecting fraud, these figures may well understate the extent of the problem.[59] Further, it is unclear how much of the fraud involves the use of cash. On the other hand, strong empirical evidence of government-benefit program fraud indicates that the problem exists, and that it is typically perpetrated by failing to declare cash income. If one assumes that one in 20, or 5 percent, of recipients regularly commits fraud by failing to disclose cash income, approximately $11 billion could be saved annually from government-program-benefits fraud by making cash electronic.[60]

Reduced Criminal Justice System Expenditures

The cost of police protection, criminal courts, prosecution, publicly-funded legal defense, prisons and jails, at federal, state, and local levels amounted to $74 billion dollars in 1990.[61] This has been one of the fastest growing area of government expense. The percentage increase from 1988 to 1990 was 22 percent or 11 percent per year.[62] This rate of increase has not been quite as steep over the last two years. If one conservatively assumes a 5 percent annual rate of increase from 1991 through 1993, the current level of overall spending on justice in 1993 may be $85 billion now.

It would seem that the amount of savings of justice expenditures from conversion to electronic cash could be projected by multiplying the percentage of crime that would be eliminated against current costs. However, it is not that simple.

59. "...losses to fraud, unlike theft, are only noticed if the fraud is discovered. In the case of government benefits, it is relatively easy to tell how much money has been paid, but very difficult to tell how much of these payments constitutes losses to fraud. To the extent that they are based on discovered cases, our estimates will tend to underestimate the true loss to fraud." Ibid., p. 255.
60. Los Angeles County publication WPC-Q2-26, "Affirm," 3/25/93. Electronic cross-checking has already proven its worth in investigating government-benefits fraud. In 1990, the Los Angeles County Department of Social Services installed an automated fingerprint image reporting and match system called *Affirm*, which compares fingerprints of individuals receiving General Assistance benefits and exposes those getting benefits under multiple names. By the end of 1991, the first full year in which *Affirm* was used, the program had saved Los Angeles County over $5.4 million. This program is now being adopted by other counties in California.
61. U.S. Department of Justice, Bureau of Justice Statistics "Justice Expenditure and Employment, 1990," Bureau of Justice Statistics Bulletin (Washington D.C.: U.S. Department of Justice), p. 1.
62. Ibid.

The basic problem is that, while it is certain that a great number of crimes would be prevented by conversion to USEMS, there is a lack of research figures upon which to base an accurate estimate. The BJS analysis cited on page 24, above, indicates that 12 percent of all reported crimes are thefts of cash only, purses, or wallets. It is fairly certain that nearly all of these crimes would be prevented by conversion to USEMS. However, the numbers of burglaries and larceny-thefts, crimes we know from empirical evidence to be highly cash-motivated, comprise some 75 percent of all reported crimes (see Table 1, page 9). Without further research data on the role of cash in these crimes we can only make rough estimates of the effects of conversion to USEMS. If half of all burglaries and larceny-thefts (excluding auto thefts) were prevented by changing over to USEMS, roughly 38 percent of all reported crimes would be eliminated. When one takes into account that cash also plays a role in other crimes, such as murder and sales of stolen autos, the 38 percent figure seems plausible. Projecting a 38 percent reduction in crime against the current $85 billion cost of justice expenditures produces a savings of $32.3 billion.

However, one must be careful not to overlook other factors involved in the proposed conversion, such as the possibility that many of the crimes eliminated by conversion to electronic money would not result in formal arrests and, thus, would not incur the full weight of criminal justice expenses. Perhaps thefts of wallets and purses fall into this category. It is more likely, however, that the crime-reducing effect of cashlessness would be felt across the full spectrum of crimes, from murder to petty theft.

There is also the possibility, in view of the fact that many law enforcement agencies are presently understaffed, that even a great reduction in the number of crimes committed would not result in a cost-savings due to downsizing of personnel. However, the benefit of this latter consequence would be better criminal justice services, such as quicker response time, lightening of court caseloads, less-crowded jails, more parole supervision, etc. Another cost-savings consideration is that the efficiencies of USEMS as an investigative and evidence-providing tool as well as a device for locating subjects may substantially reduce the time and cost involved in these procedures.

At the very minimum, conversion to USEMS would result in a savings of $10.2 billion (12 percent x $85 billion). However, it is conceivable that adoption of USEMS could be accompanied by as much as a 50 percent reduction in crime, in which case the projected criminal justice cost-savings would be around $40 billion annually.

Reduced Victim Costs

The list of prospective private-sector benefits from making cash electronic, including reduced cost of goods and services for practically everything — e.g., taxes and lowered insurance rates — and increased competitiveness in foreign trade, is far too extensive to cover in this report. One item can be discussed, however, as an example: the reduction of the cost of crime to victims.

The NCVS has estimated that the total loss to individual victims and households in 1991 was $19.4 billion (this figure excludes losses from commercial and business crimes). By projecting the percentage of crimes that would be prevented by converting to electronic money against the $19.4 billion loss figure, we get an idea of the prospective savings. If the 12 percent estimate is used (based on thefts of cash-only, purses, and wallets) the projected savings would be $2.3 billion. Because losses to individuals far exceed those from such thefts, a higher percentage should be used in this calculation. Using the 38 percent figure developed in the preceding section, Reduced Criminal Justice Expenditures, produces a loss savings of $7.4 billion.

Some estimates are even higher. The Office of National Drug Control Policy estimates that, in 1990, there were between 1.7 and 1.8 million heavy cocaine users, 0.7 million heroin users, and 5.5 million "users who are clearly in need of treatment."[63] The amount of crime being committed by some of these drug users is believed to be quite high. Mathea Falco states that "offenders with the most serious drug problems are each responsible for as many as 90 robberies and burglaries a year."[64] Other estimates of the number of crimes per year are even higher.[65] However,

63. What America's Users Spend on Drugs, an Office of National Drug Control Policy technical paper, June 1991, p. 23.
64. The Making of Drug-Free America, op. cit., p. 133.
65. Economists at the University of California at Santa Barbara estimate drug addicts commit 22 crimes a month, on the average.

some experts, who estimate the figure at substantially less than one million,[66] challenge the number given by the government for heavy drug users.

Pre-sentencing investigation data from bank robberies reveal that one-quarter of all bank robbers intended to use the stolen cash to support drug use.[67] The causal relationship between robberies and burglaries, and cash is further exemplified by police experience. When Operation Pressure Point, which targeted street drug sales conducted exclusively in cash, was put into effect by the NYPD in Manhattan in 1983, burglaries fell by one-third, and robberies dropped by one-half.[68]

The true number of heavy drug users probably lies somewhere between the government's figures and those of other experts. Let's assume that there are 1.25 million drug addicts who commit one robbery or burglary a week. A 1990 government survey puts the victim's cost for each crime at $787.[69] Calculations based on these assumptions indicate that the overall loss to Americans from crimes committed by hard-core drug users, comes to some $51 billion a year.[70]

Since robberies and burglaries are almost always perpetrated to obtain cash, directly or through sales of stolen property, it is reasonable to predict that changing to electronic money, which should have greater effect on drug sales than did the mere increased police activity in Operation Pressure Point, would result in at least a 50 percent drop in these crimes. This, in turn, would mean a savings to individuals of around $26 billion a year.

66. "Hawks Ascendant," The Punitive Trend of American Drug Policy, op. cit., pp. 30-32.
67. U.S. Department of Justice, Bureau of Justice Statistics, "Bank Robbery," Bureau of Justice Statistics Bulletin (Washington, D.C.: U.S. Department of Justice) p. 2. "Drug use appears to be common among bank robbers, according to two different data sources .... Twenty-eight percent of all bank robbers were considered addicted [to opiates].... The FBI has estimated that as many as 42 percent of all bank robbers used drugs .... Pre-sentencing investigation reports revealed that 8 percent of the offenders were intoxicated with some drug (excluding alcohol) at the time of their offense."
68. The Making of Drug-Free America, op. cit., p. 83.
69. U.S. Department of Justice, Bureau of Justice Statistics, Survey Estimate of the Economic Cost of Crime to Victims (Washington, D.C.: U.S. Department of Justice, 1990), Appendix IV. This figure is calculated by dividing the number of robberies and burglaries into the gross loss indicated for those crimes. Gross loss, in the Survey, "was derived by summing up the amount of stolen cash, the value of stolen property, estimated or actual costs of replacing damaged property, pay lost from work because of injuries, police-related activities, court-related activities, or time spent repairing or replacing property."
70. Admittedly, this figure does not correspond to figures produced in the respectable National Crime Victimization Survey. Ibid., which in 1991 showed an overall economic loss to victims of crime of only $19.2 billion. While that survey does not include commercial victimizations, the fundamental reason for the gross discrepancy is directly related to estimates of the number of drug addicts who are committing crimes to support their drug use.

If the reader suspects that this figure is too high, consider that this calculation addresses only crimes perpetrated by hard-core addicts and does not include crimes of less-addicted and non-addicted criminals. Furthermore, there are victims' costs from other *types* of crimes — embezzlement, kidnapping, bribery, and loan sharking, to name but a few that would be affected by the change-over to electronic cash. Violent crimes committed in conjunction with robberies and burglaries should not be overlooked. An extensive crime victimization survey revealed that "Over half of all robbery victims were attacked. About 1 in 12 robbery victims experienced serious injuries such as rape, knife or gunshot wounds, broken bones, or being knocked unconscious."[71] "Three-fifths of all rapes in the home and about a third of home aggravated and simple assaults are committed by burglars."[72] The medical and psychological damages, lost wages, etc., associated with cash-motivated robberies and burglaries, unquestionably, exceed the value of cash or other property taken in these crimes. And, in many instances, the harm done is irreparable and immeasurable.

Calculation of the grand total of pecuniary benefits Americans would gain in switching to electronic money depends on how many economic aspects are included within the scope of such an undertaking. For example, there would be sizeable cost-savings from the nation's reduced security requirements, ranging from armored car services to burglar alarms. Theft and liability insurance rates would fall. Freed from the constant threat of robberies, retail businesses would once again flourish in inner cities. It would require several pages merely to identify the profitable ramifications of conversion to USEMS.

It does not require lengthy thought to understand that deep savings would permeate the entire economy, and it is probable that overall economic gain to the private sector would reach at least $53 billion a year, and it could run much higher (Table 4). Whatever the true numbers, they are convincingly high to forego the need to calculate them precisely.

71. "Robbery Victims," op. cit., p. 1. Figures are based on a study conducted from 1973 to 1984.
72. U.S. Department of Justice, Bureau of Justice Statistics, "Household Burglary," Bureau of Justice Statistics Bulletin (Washington, D.C.: U.S. Department of Justice), p. 1.

TABLE 4
COST BENEFIT SUMMARY
OF CASHLESS SOCIETY

	HIGH	LOW
A. Victim Savings	$26.0 billion	$42.3 billion
B. Reduced Criminal Justice Costs	$40.0 billion	$10.2 billion
C. Increased Tax Revenues	$30.0 billion	$30.0 billion
D. Reduced Government Fraud	$10.9 billion	$10.9 billion
TOTAL SAVINGS	$106.9 billion	$53.4 billion

Summary

Few historical opportunities offer so much social and economic gain for so little investment. This does not mean undertaking the USEMS would be effortless or without dislocation of some industries. And it would be unreasonable to claim that the proposed monetary conversion would be easily implemented. If there are obstacles to the development and deployment of the new money system, such as unforeseen difficulties, or unanticipated outlays of funds, they must be indulged and overcome. The continuing cost to the nation of passing up the opportunity to eliminate a large portion of its crime, not to mention the fiscal gains that would be forsaken, is too great.

In the 1990s, America has all the components necessary to make its cash electronic: a bankcard-knowledgeable public, advanced technology, and capable industries. All that remains is for Congress to seize upon this rare and invaluable opportunity. But, as long as cash remains in circulation, preventable crime, and the vast economic waste that accompanies it, will continue to soar.